TAMING THE DATA MONSTER

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Introduction

Some time ago, the U.S. Army's Communications-Electronics Command (CECOM) Acquisition Center's (Fort Monmouth, NJ) leadership recognized that its disparate legacy systems were adversely impacting its business transformation efforts. As process visionaries, they knew significant improvements could be made. Data required for monitoring, analyzing, answering data calls, and reporting purposes were spread throughout a number of major legacy systems and dozens of other smaller systems residing on various desktop computers. Some of the data were redundant and required manual data entry, which precipitated errors and severely impeded accurate and timely analysis. Reporting was difficult, cumbersome, and time-consuming for all involved. Reports from different systems used different parameters, thus causing "apples and oranges" comparisons. Additional limitations were encountered when information from remote sites had to be consolidated. To tame this unwieldy data monster, CECOM pursued development of the Acquisition Resource Center (ARC).

Project Description

The ARC is a data mart coupled with a suite of tools. It was designed by contracting functional experts and allows management and end users to access disparate data, from small local databases to large legacy databases. This data can be consolidated into an intuitive "business intelligence" tool for the contracting workforce and managers.

More than 75 CECOM Acquisition Center employees are currently using the ARC. These users represent all levels of the workforce (i.e., senior executives, sector and group chiefs, and contracting officers). The ARC offers many benefits, including Web-based data entry screens incorporating data validation logic, a data warehouse to replace older stand-alone systems, and a robust and intuitive reporting tool. Data in existing enterprise-level systems are accessed directly rather than duplicated. Users can now report on data in existing systems as well as data previously available only in hard-copy, monthly produced formats. Information can be easily consolidated from all of the CECOM Acquisition Center's locations.

Many positive impacts have been realized since the implementation of the ARC. In the past, CECOM's Monitoring and Analysis Group (consisting of procurement analysts) had to query multiple sources residing in different software systems (i.e., Oracle®, Sybase®, Model 204®, SQL-Server®), and even hard-copy reports, to respond to data calls. The group was required to construct queries in the native software languages of the database that the information was stored in or had to rely on the software development team to create these queries. Further, the group was limited to using only one data source at a time. Now the group can achieve the same results using "drag-and-drop" technology and has the ability to marry data from different sources in one report.

Key business reports are published on the CECOM Acquisition Center knowledge portal—the Knowledge Center—in PDF format. This gives the entire workforce access to the information. Reports are automatically refreshed weekly during off-hours, thereby eliminating the need to impact daily business processes.

Report Sharing

Another way that ARC users share reports is through BusinessObjects®, a powerful business intelligence tool. BusinessObjects is a commercial off-the-shelf (COTS), Microsoft® Windows-based reporting tool that enables users to query and analyze data from a corporate database. Reports can be published to the BusinessObjects InfoView Web site where users can retrieve, view, and refresh the reports. Other Acquisition Center campus offices needing report information can create the report and then be in complete control of retrieving the data whenever required. Numerous organizations that formerly contacted the Monitoring and Analysis Group for data were given access to BusinessObjects and now have unprecedented access to their own data. Remote users can easily edit existing reports for their particular needs or create new reports or ad hoc queries from scratch.

Tying together different data systems and sources has provided the opportunity to improve many of CECOM's business processes. There are several areas where these processes have replaced tedious and time-consuming manual processes. For example, the reconciliation of the *Individual Contracting Action Report* (DD Form 350), a laborious report effort conducted at the end of each year, is now automated and tracked throughout the year to ensure that reports are

timely and accurate. Additionally, there is an automated process, which moves this improved data from one database to another. Aside from eliminating a duplicative data entry burden, this new system has tremendously improved data accuracy.

Other Efforts

Many other process and access areas were simplified and streamlined by the ARC. Wherever possible, data are accessed directly, rather then replicated. In most cases the ARC is able to connect directly to CECOM's legacy systems to cull reports. Supplemental data are copied into a data mart and augmented with data entered locally by CECOM Acquisition Center users for additional management decision support reports.

A number of smaller, local databases are not in an enterprise-level system, but rather reside on just one computer at an employee's workstation. If the data owner is on leave or on travel, or having PC problems, the data are unavailable, thus making these systems undesirable "single-user" platforms. These systems are in the process of being replaced with an enterprise-level Oracle database, Web-based front-end data-entry screens, and BusinessObjects reports. Customer-focused systems are also being used to help validate data on the data-entry screens as well as produce dynamic drop-down lists for a real-time list of values on the screens.

The Knowledge Center is planning to integrate these enhanced systems to effect an Armywide shift toward improved knowledge management and broader accessibility. This integration promises to further the Acquisition Center's business transformation goals.

Decision Process

The initial phase of the ARC project evaluated current processes and established the potential for tapping into existing systems. The team began the arduous process of establishing which systems contained needed data, and how and what to access. One of the initial goals was to access the required data without replicating it, provided that the systems were already enterprise-level. Local Access databases, Excel worksheets, and proprietary stand-alone databases were evaluated with an eye toward migrating them to a robust enterprise-level system.

Once the analysis and prioritization process was completed, available technologies were evaluated. Three main technological areas of the project needed to be addressed:

- First, a robust, intuitive reporting system needed to be selected.
- Second, a Web-based, front-end data entry form technology had to be identified.
- Third, a robust, enterprise-level database management system had to be agreed upon.

For the project to succeed, the reporting systems needed to be easy to use and intuitive. One of the project's goals was to shift report development from technical developers to end users with domain knowledge of the data. These end users may or may not have advanced computer skills, making an intuitive application a necessity. To choose the appropriate tool, several evaluation criteria were considered. These included scalability, integration, quick setup, ability to handle multiple data sources, and cost. After evaluating the major players in the business intelligence field, BusinessObjects was selected as the reporting tool for the ARC.

Because security was a major feature to be considered, BusinessObjects was evaluated and found to offer a robust security module enabling administrators to restrict access to the system and to report categories, specific reports, data sources, and even data down to the field and record level. User roles can be created to group similar users. Password rules and change frequency can also be established to ensure that information security is maintained.

IBM Lotus Notes® was selected as the tool of choice for the front-end development. It has a rapid development framework and ensures easy integration with other CECOM Acquisition Center systems also developed in Lotus Notes. Similarly, Oracle was selected as the relational database management system of choice to more easily integrate with existing legacy systems and tap into existing resources.

Conclusion

The ARC has had a very positive impact on the CECOM Acquisition Center. It has helped to streamline many business processes and improved data entry and reporting. These accomplishments include the elimination of duplicative processes and manual data entry, enhanced reporting through the ability to join and migrate legacy and local information, and augmented data entry by incorporating pick lists and online data validation. This resulted in major time savings and improved accuracy and detail suitable for all levels of management.

The flexibility and ease of reports produced using BusinessObjects has improved CECOM's responsiveness to data calls and transformed the emphasis from report production to analysis of the data. This will provide the CECOM Acquisition Center with the opportunity to pursue even more improved technological advances to facilitate its extended business goals. For the time being, the monster has been tamed.

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